The infected milk model of Fig. 3.2 contains a process model and an observation model. a.k.a. state evolution model

\[ S_i \rightarrow \cdots \rightarrow S_n \] process model

\[ O_i \] observation model
In the absence of observations, the process model describes the evolution of the variable(s) you are interested in (i.e., the state of what you model).

In the absence of a process model, the observation model gives you the most likely state of your process.

In Fig. 3.2, they are put together.

The first application of this kind of time-repeating model was in astronomy (Augustus Thiele, ca. 1880). In Thiele’s work, both state and observation variables were Gaussian, and the
conditional probability "tables" \( S_{i-1} \rightarrow S_i \) and were conditional Gaussian.

We do very little with conditional Gaussian distributions.

In Thiele's work, the state variable was the position of a celestial body.

Fig. 3.4 could be redrawn with an explicit node indicating whether a test was working correctly at time \( i-1 \).
This is the test correctness model part of the overall model.